

## REMARKS

The above amendments to the above-captioned application along with the following remarks are being submitted as a full and complete response to the Official Action dated June 26, 2003 and the telephone conversation with the Examiner on September 22, 2003. As suggested by the Examiner, Applicants will contact the Examiner after October 14, 2003, to schedule a telephone interview. In view of the above amendments and the following remarks, the Examiner is respectfully requested to give due reconsideration to this application, to indicate the allowability of the claims, and to pass this case to issue.

### Status of the Claims

Claims 4-6 are under consideration in this application. Claims 8-13 are being canceled without prejudice or disclaimer. Claims 4-6 are being amended, as set forth in the above marked-up presentation of the claim amendments, in order to more particularly define and distinctly claim applicants' invention.

### Additional Amendments

The claims are being amended to correct formal errors and/or to better disclose or describe the features of the present invention as claimed. All the amendments to the claims are supported by the specification. Applicants hereby submit that no new matter is being introduced into the application through the submission of this response.

### Prior Art Rejections

Claims 4 and 12 were rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Pat. No. 6,347,259 to Goldenberg et al. (hereinafter "Goldenberg") and U.S. Pat. No. 6,101,946 Martinsky (hereinafter "Martinsky"), and claims 4-6 and 8-13 were rejected under 35 U.S.C. 103(a) on the grounds of being unpatentable over WO 98/20019 to Lough et al. (hereinafter "Lough") and U.S. Pat. No. 6,322,970 Little et al. (hereinafter "Little"). These rejections have been carefully considered, but are most respectfully traversed.

The spotting pin formed to spot a solution containing at least one reagent on a plate according to the invention, comprises a solid member having a recess formed only at a cylindrical head end (page 11, line 14) thereof, said head end being formed to carry the reagent within the

recess to the plate. The recess is concave-shaped and comprises a cross-shaped groove therein, and the groove has a width and a depth shorter than a head end width (Fig. 6B; claim 4). In a second embodiment (Fig. 6C; claim 5), the recess formed is a cross-shaped groove, and the groove has a width and a depth shorter than a head end width. In a third embodiment (Fig. 6D; claim 6), the recess comprises two V-shaped notches crossing each other at right angles. The invention applies such pins so formed to **spot** a solution containing at least one reagent on a plate to control **spotting** shapes and amounts (page 11, lines 21-22).

As admitted by the Examiner (page 5, last paragraph; page 6, 4<sup>th</sup> paragraph of the outstanding Office Action), none of the cited prior art references teaches or suggests such a recess formed only at its head end thereof and having “a cross-shaped groove at its cylindrical concave-shaped or flat head end, or “two V-shaped notches crossing each other at right angles at its cylindrical head end.” Even the reference to Martinsky only teaches a printing pin (Fig. 3B) having a **square** (rather than “cylindrical”, col. 4, line 54) head end with a flat tip 32 and a sample channel 22 formed thereon. The square head end is required for controlling **printing** (“*direct surface contact*” col.1, lines 45-46) shapes or amount. On the other hand, the pins of the invention are designed for controlling **spotting** (“*non-contact*” col. 1, line 42) shapes and amounts.

In addition, the sample channel 22 is 0.004” wide and 0.125” deep (col. 4, lines 58-59), while the square head end 20 is 0.004” \* 0.004” (col. 4, lines 53-54). In other words, the sample channel 22 (arguably equivalent to the groove or notch of the invention) is as wide as (rather than shorter than) the head end width, and its depth is 31 times (rather than shorter than) of the head end width. The channel depth is significantly longer than the width of the channel/head end so as to **print** (“*direct surface contact*” col.1, lines 45-46) shapes on the plate. On the other hand, the pins of the invention are designed for **spotting** (“*non-contact*” col. 1, line 42) shapes on the plate such that the groove/notch depth is much shorter than the width of the head end (Figs. 6B-D).

Rather than obvious or arbitrary design choices as alleged by the Examiner, Applicants respectfully contend that the specific recess shapes, groove/notch dimensions of the spotting pins as now recited in claims 4-6 were deliberately invented for dipping in a solution vessel, catching the proper amount of solution, carrying the amount of solution by surface tension (page 11, lines 3-4), then **spotting** the amount of solution on a plate. Although the invention applies a concave-shaped recess with a groove therein, the specific recess shapes, groove/notch dimensions

designed for *spotting* were unknown in view of Martinsky (*printing* pins), since Martinsky's sample channel is designed with different dimensions to accommodate a different purpose. In other words, the advantages of the invention would not flow naturally from following the teachings of Martinsky, since Martinsky fails to suggest the specific recess shapes, groove/notch dimensions, as well as any such features for *spotting*.

In fact, Martinsky specifically discourages the use of *ink-jetting and other "drop-on-demand" devices* (col. 1, line 38-53) as does the invention, and Martinsky criticizes their deficiencies (including *imprecise sample uptake and delivery, lack of durability*). It is well established that a rejection based on cited references having contradictory principles or principles that teach away from the invention is improper.

The holding "pins" of the pin tools in Lough share similar deficiencies as the printing pin of Martinsky. As shown in Figs. 9D-9E, the channel or hole therein is design to accommodate an optical fiber to connected externally for mass spectrometer detection (page 19, lines 13-15) such that the channel depth/length is significantly longer than the width of the channel/head end. On the other hand, the pins of the invention is designed for dipping-carrying-*spotting* shapes on the plate such that the groove/notch depth is much shorter than the width of the head end. Lough's channel/hole is designed with different dimensions to accommodate a different purpose.

Furthermore, as mentioned in the prior response, Lough's pins are holders rather than dispensers or transferring means as the pin of the present invention. The holding (rather than temporarily carrying) pins of Lough (Fig. 8) are *fixed* with the breads/probes, the nucleic acid ("immobilized" thereon), or PCR primers (page 18, line 16 to page 19, line 10) such that the breads/probes, etc. fixed thereon can be dipped into matrix solution or sprayed with the matrix solution with a microdrop device (page 20, lines 20-24). In other words, the holding pins do not dispense or spray the matrix solution but the microdrop device does. The breads/probes, etc. are so fixed on the holding pins that they have to be cleaved from the holding pins (page 20, line 25) with a sharp instrument so as to drop into a plate.

The pins of Little which also have a channel or hole therein are also designed to accommodate an optical fiber to connected externally for mass spectrometer detection (col. 50, lines 40-42) such that the channel depth/length is significantly longer than the width of the channel/head end. On the other hand, the pins of the invention are designed for dipping-carrying-spotting shapes on the plate such that the groove/notch depth is much shorter than the width of the head end. Little's channel/hole is designed with different dimensions to accommodate a

different purpose.

Goldenberg fails to compensate for the deficiencies of Martinsky, Lough, and Little. Goldenberg's spotting pin 54 in Figs. 7-8 has the groove 62 extending from the top across the body to the tip/head end which functions as an elongated channel for holding a solution *beyond the tip/head end*. The groove length is significantly longer than the width of the head end. On the other hand, the pins of the invention are designed for spotting shapes on the plate such that the groove/notch depth is much shorter than the width of the head end. Goldenberg's channel/groove is designed with different dimensions to accommodate a different purpose.

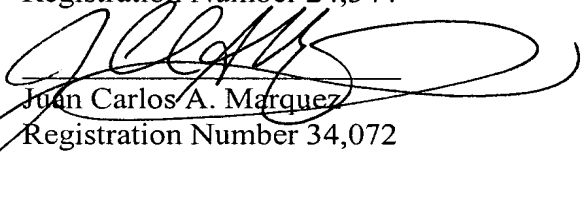
Applicants contend that neither the cited references, nor their combinations teach or disclose each and every feature of the present invention as disclosed in independent claims 4-6. As such, the present invention as now claimed is distinguishable and thereby allowable over the rejections raised in the Office Action. The withdrawal of the outstanding prior art rejections is in order, and is respectfully solicited.

In view of all the above, clear and distinct differences as discussed exist between the present invention as now claimed and the prior art reference upon which the rejections in the Office Action rely, Applicant respectfully contends that the prior art references cannot anticipate the present invention or render the present invention obvious. Rather, the present invention as a whole is distinguishable, and thereby allowable over the prior art.

Favorable reconsideration of this application is respectfully solicited. Should there be any outstanding issues requiring discussion that would further the prosecution and allowance of the above-captioned application, the Examiner is invited to contact the Applicants' undersigned representative at the address and phone number indicated below.

Respectfully submitted,

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